

WHAT IS CLAIMED IS:

1. A cardiac port for insertion through a chamber wall of a heart chamber to perform a medical procedure inside of a beating heart, comprising:

a housing having a first end, a second end, and a lumen therethrough;

at least one valve disposed in the housing to open and close the lumen; and

an inlet connected to the housing, the inlet having an inlet passage in fluid communication with the lumen of the housing, the inlet adapted to transmit a fluid between an exterior of the port and the lumen of the housing.

2. The apparatus according to claim 1, wherein the housing includes a first portion and a second portion, the second portion having a length substantially equal to a thickness of the chamber wall.

3. The apparatus according to claim 2, wherein the second portion is flexible relative to the first portion.

4. The apparatus according to claim 2, wherein the inlet connects to the housing adjacent a position of the at least one valve.

5. The apparatus according to claim 1, wherein the housing has first and second retainer members to retain the chamber wall therebetween.

6. The apparatus according to claim 5, wherein the first and second retainer members are annular flanges that encircle the exterior surface of the housing.

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7. The apparatus according to claim 1, wherein the housing includes a first portion having a first diameter and a second portion having a second diameter smaller than that of the first portion.

8. The apparatus according to claim 7, wherein the second portion has a length substantially equal to a thickness of the chamber wall.

9. The apparatus according to claim 7, wherein the second portion is flexible relative to the first portion.

10. A cardiac port for insertion through a chamber wall of a heart chamber to perform a medical procedure inside of a beating heart, comprising:

a housing having a first end, a second end, and a lumen therethrough;

at least one valve disposed in the housing to open and close the lumen; and

first and second retainer members on the housing, the first retainer member being spaced from the second retainer member a predetermined distance to anchor the chamber wall between the first and second retainer members.

11. The cardiac port according to claim 10, wherein the first and second retainer members comprise first and second flanges disposed on an exterior surface of the housing.

12. The cardiac port according to claim 11, wherein a portion of the housing between the first flange and the second flange is flexible relative to a remaining portion of the housing.

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13. The cardiac port according to claim 11, further comprising an inlet connected to the housing, the inlet having an inlet passage in fluid communication with the lumen of the housing, the inlet passage adapted to transmit a fluid between an exterior of the port and the lumen of the housing.

14. An assembly for use in performing a medical procedure inside of a beating heart of a patient, comprising:

a port including

a housing having a first end, a second end, and a lumen therethrough, the housing configured for insertion through a chamber wall of a heart chamber so that the first end is exterior of the chamber wall and the second end is interior of the chamber wall;

at least one valve disposed in the housing to open and close the lumen; and

an inlet connected to the housing, the inlet having an inlet passage in fluid communication with the lumen of the housing; and

a fluid transport device having one end that attaches to the inlet of the port, another end that attaches to a fluid source, and a fluid channel therebetween to pass a fluid from the fluid source to the inlet, whereby the fluid passes from the inlet through the inlet passage and through the lumen into the heart chamber to maintain an intra-chamber pressure at a desired level.

15. The apparatus according to claim 14, wherein the another end of the fluid delivery device is configured to insert into an artery of the patient to permit passage of arterial blood through the fluid channel.

16. A method of accessing an interior of a heart chamber of a heart, comprising the steps of:

maintaining beating of the heart; and

inserting a port in a chamber wall of the heart chamber, the port having a lumen therethrough for accessing the interior of the heart chamber from exterior of the heart chamber.

17. The method of claim 16, wherein the inserting step comprises securing the port in an atrial wall to access an interior of the heart.

18. A method of preparing a beating heart for a diagnostic or medical procedure, comprising the steps of:  
inserting a port in a chamber wall of the beating heart, the port having a lumen to access to the heart chamber; and  
pressurizing the heart chamber with blood from a patient's artery.

19. The method according to 18, wherein the inserting step comprises inserting the port through an atrial wall.

20. The method according to claim 18, further comprising the step of positioning a cannula through the chamber wall, and the pressurizing step includes shunting arterial blood from the patient's artery into the heart chamber via the cannula.

21. The method according to claim 18, wherein the pressurizing step includes shunting arterial blood from the patient's artery into the heart chamber via the port.

22. An apparatus for cutting a suture, comprising:  
an elongated body having a lumen, a wall member extending into the lumen, and a knot-receiving chamber defined by a first area on a first side of the wall member, the wall member defining a channel therethrough, the

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channel being dimensioned to permit passage of a suture and to prevent passage of a knot; and

a cutting implement movably disposed in the lumen in a second area on a second side of the wall member opposite the first side, the cutting implement movable between a first position and second position to cut the suture.

23. The apparatus according to claim 22, further comprising an actuator to move the cutting implement between the first position and the second position.

24. The apparatus according to claim 22, wherein the second side of the wall member has an angled upper surface, and, when in the first position, the cutting implement is disposed opposite the angled upper surface.

25. The apparatus according to claim 24, wherein the second side of the wall member further includes a stop surface located opposite the angled upper surface, and, when in the second position, the cutting implement contacts the stop surface.

~~26.~~ An apparatus for cutting a suture, comprising:  
an elongated body having a lumen to pass a suture therethrough; and  
a cutting implement positioned inside the elongated body to cut the suture.

27. A method for repairing a damaged heart valve of a beating heart, comprising the steps of:

inserting a valved port in a chamber wall of the beating heart to access an interior of a heart chamber;

inserting a stapling device through the valved port; and  
positioning staples from the stapling device into at least a portion of  
the mitral valve annulus of the damaged heart valve to reduce a length of  
the portion of the mitral valve annulus.

28. The method according to claim 27, further comprising the step  
of connecting the staples together with a strip of material.

29. The method according to claim 27, wherein the positioning  
step comprises placing staples into the posterior mitral annulus.

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